Announcements

- EXAM 2 on Tuesday, March 14!
- Homework for tomorrow…

  Ch. 31: Probs. 26, 62, & 64

  CQ10: a) *A*, *B* = *C* b) *A* gets brighter, *B* & *C* go out
  31.20: 12 Ω
  31.22: 24 Ω
  31.46: 60 V

- Office hours…

  MW 10-11 am
  TR 9-10 am
  F 12-1 pm

- Tutorial Learning Center (TLC) hours:

  MTWR 8-6 pm
  F 8-11 am, 2-5 pm
  Su 1-5 pm

Chapter 31

Fundamentals of Circuits

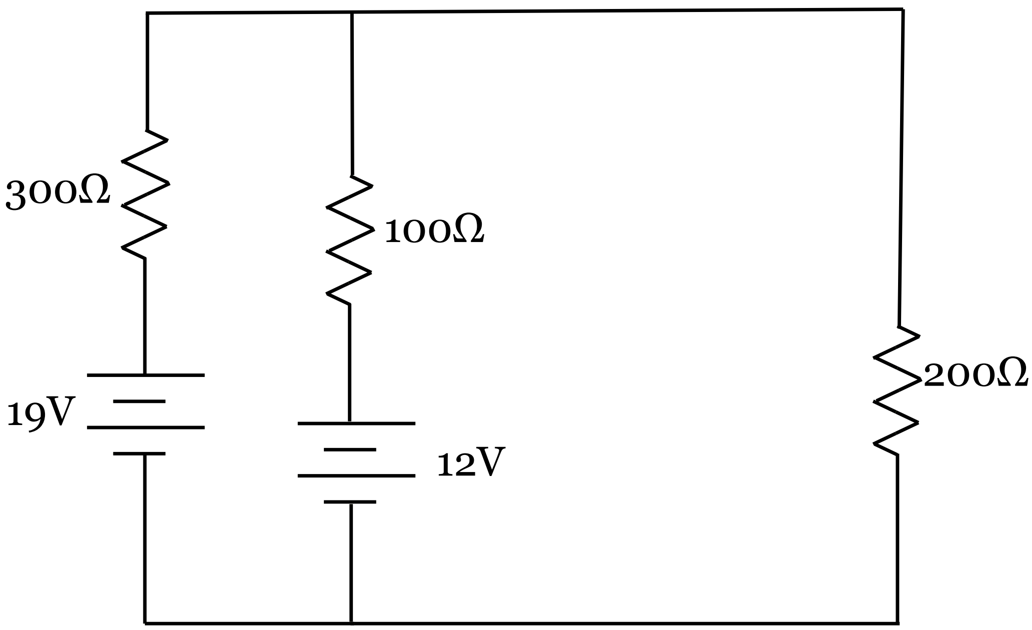
(*Resistor Circuits & Getting Grounded*)

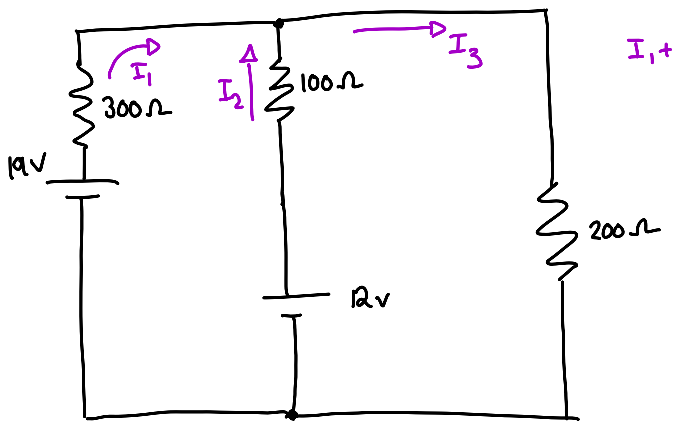
Resistor Circuits

1. Draw a circuit diagram, labeling all known quantities.
2. Reduce circuit to the smallest possible number of equivalent resistors.
3. Write Kirchoff's loop rule for each loop and Kirchoff's junction rule for each junction.
4. Solve the equations and check your results.

i.e. 31.11: Analyzing a two-loop circuit

Find the current through and the potential difference across the 100Ω resistor in the circuit below.





$I_1 + I_2 = I_3$

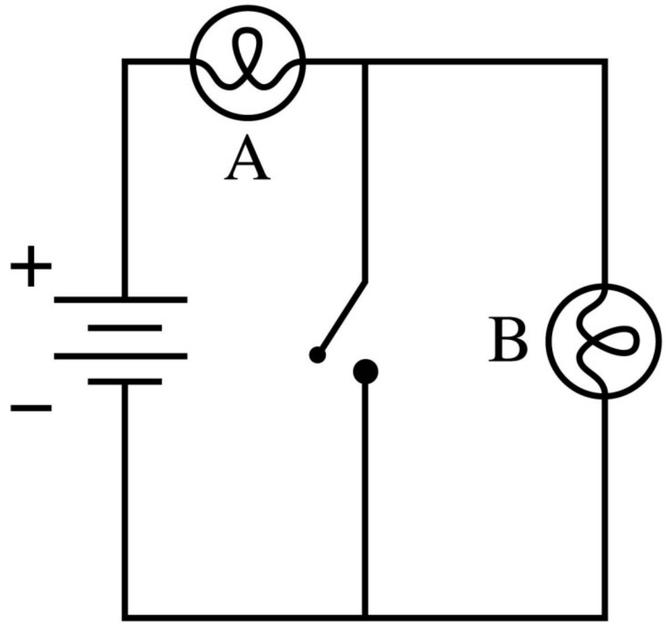
Big loop $19V - I_1(300\Omega) - I_3(200\Omega) = 0$

Left loop $19V - I_1(300\Omega) + I_2(100\Omega) - 12V = 0$

Right loop $12V - I_2(100\Omega) - I_3(200\Omega) = 0$

Quiz Question 1

The light bulbs are identical. Initially both bulbs are glowing. What happens when the switch is closed?



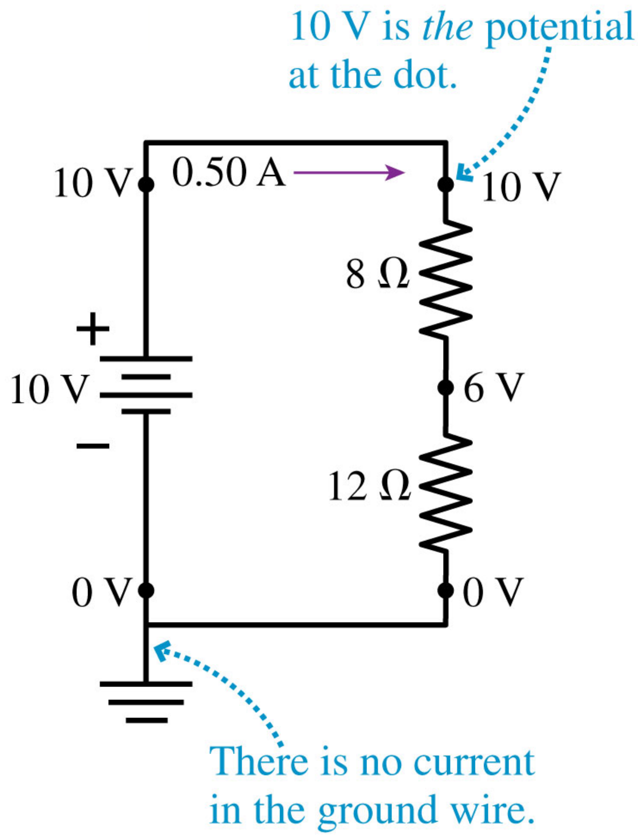
1. Nothing.
2. A stays the same;
   B gets dimmer.
3. A gets brighter;
   B stays the same.
4. Both get dimmer.
5. A gets brighter;
   B goes out.

31.8:
Getting Grounded

- If we connect one point of a circuit to the earth by an ideal wire, we can agree to call potential of this point to be that of the earth: $V_{\text{earth}} = 0$ V.

- Under *normal circumstances*, there is ZERO current in the grounding wire.

- Grounding allows us to have *specific values* for the potential at each point in the circuit.



i.e. 31.12:
A grounded circuit

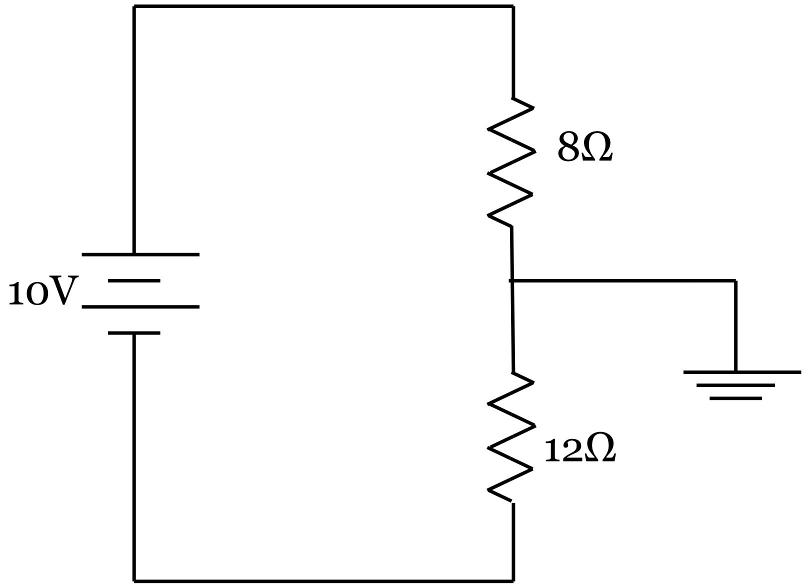
Suppose the circuit of the figure below is grounded at the junction between the two resistors instead of at the bottom.

Find the potential at each corner of the circuit.

$10V - I(8\Omega) - I(12\Omega) = 0$

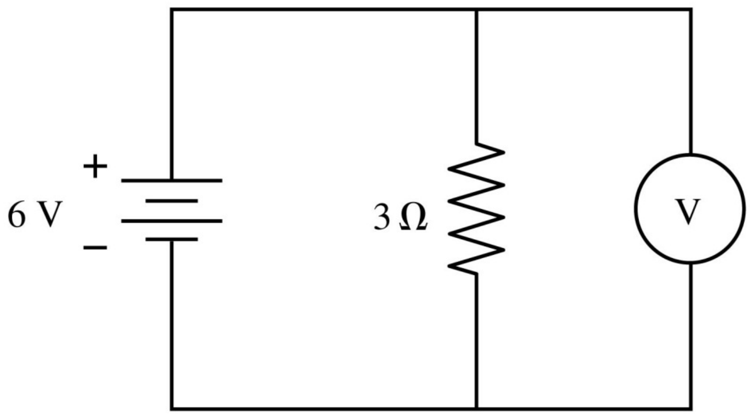
$10V = I(20\Omega)$

$I = 0.5A$



Quiz Question 2

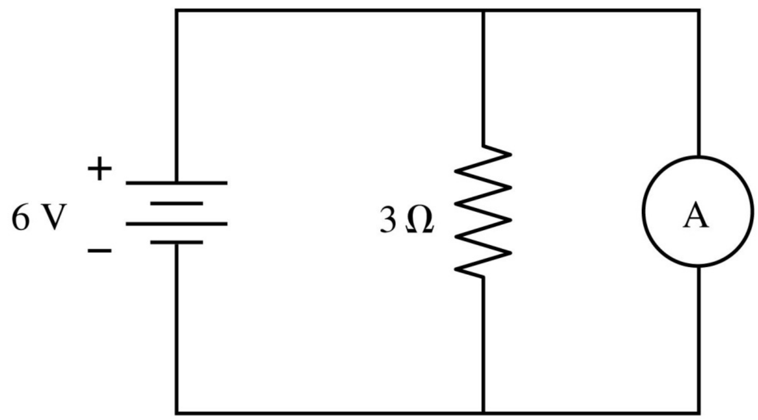
What does the voltmeter read?



1. 6 V.
2. 3 V.
3. 2 V.
4. Some other value.
5. Nothing because this will fry the meter.

Quiz Question 3

What does the ammeter read?



1. 6 A.
2. 3 A.
3. 2 A.
4. Some other value.
5. Nothing because this will fry the meter.